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A Note on Demographic Factors and Implications for Skills Development

Prepared for the Expert Panel on Skills
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Canada

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Implications for Skill Development**

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Summary

Demographic trends suggest that the pool of human capital on which knowledge industries can draw will be shaped by the age profile of the labour force.

The population bulge generated by the baby boom has largely moved into age groups where radical switches to new occupations are rare. Adjustment to growing needs of knowledge industries falls more heavily on the incoming cohorts as a result.

Maintaining or expanding the pool of human capital will demand an increased focus on groups traditionally excluded from large investments in human capital including aboriginals and those growing up in low income families.

Acknowledgement

The author would like to thank Informetrica Ltd., of Ottawa, for their kind permission to use population and labour force projections they developed in 1997 for another project.

Introduction

This note offers a brief overview of the implications of demographic trends on the ability of the economy to meet a growing need for skills or human capital. As the Canadian economy adjusts to an environment where knowledge is a major factor in wealth creation, skill development becomes a critical success factor. Skills and human capital are, by definition, embodied in people, and the ability to develop human capital in people is related to age and other characteristics.

How does an economic system adjust to a general increase in demand for higher skill? There are several major ways of adding human capital to an economic system including:

- education and training of cohorts entering the labour force,
- training and the acquisition of experience from an existing workforce,
- educating and training underutilized segments of the population, and
- importing skilled persons from outside the system via immigration.

Demographics have some implications for the capacity of the economy to add skills from these sources, based in part on the age profile of the population. For example, the ability to add to the stock of human capital through the cohort entering the labour market depends on the size of the cohort, as well as average education or skill level in the cohort.

During the seventies and eighties, the Canadian economy received a large injection of human capital from the entry of a large, highly educated cohort of baby boomers. While Canada continues to have very high rates of post-secondary enrollment, as the size of the entering cohort is reduced, the flow of incoming human capital is smaller. If there is some magic rate of increase in human capital required to support the knowledge economy, other sources of human capital formation need to be drawn upon as demographics stem the flow of human capital from the entering cohort.

One of the fundamental assumptions here is that investments in skill, from an economic point of view, have greater returns when they can be used for a longer period of time. While few doubt that life-long learning is critical in an economy where technology and associated skills change rapidly, the fact is that the capacity to adjust to new requirements is currently focused on youth. This focus may have some basis in cognitive abilities related to age (can you teach the old dog new tricks?), but is also related to the greater returns reaped over the longer period that younger people remain in the labour force.

The remainder of this note looks at four elements of the demographic picture related to skills: the impact of the age profile of the population, the impact of the age profile of the labour force, the case of the aboriginal population, and a concluding word on the proportion of youth growing up in relatively poor households. The overall message is that pressures due to an aging labour force can be alleviated by tapping sources of human capital that have been underdeveloped and under used.

Trends in Population

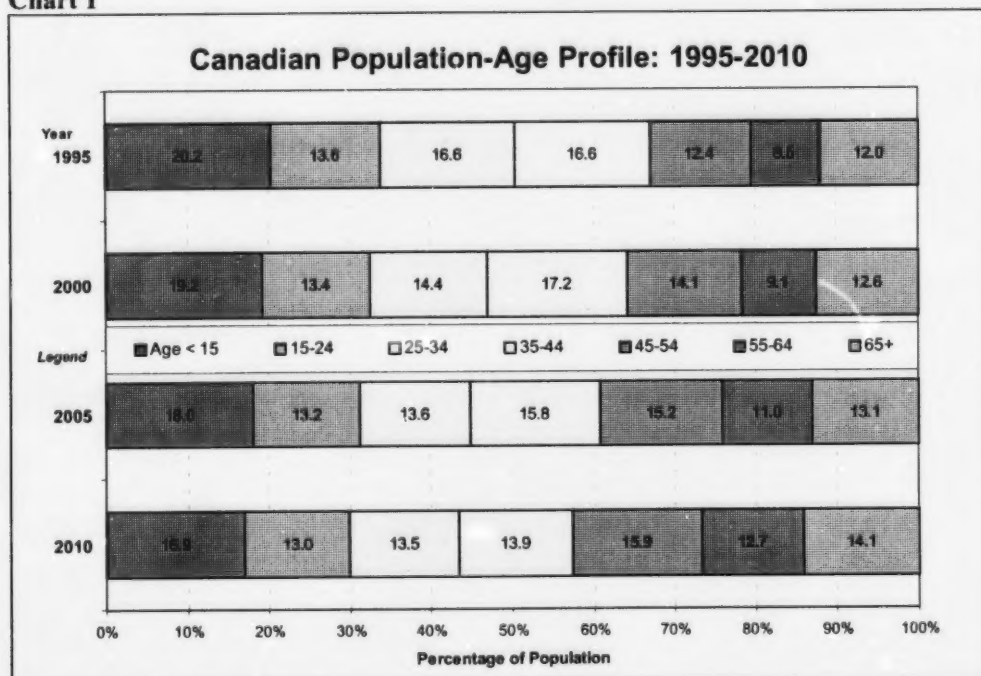
Most Canadian population projections indicate an increase in population of about one percent per year, or roughly 300 thousand individuals. About half of that growth is due to births minus deaths in the Canadian population, while net immigration from other countries, based on immigration of roughly 210 thousand and emigration of 60 thousand, accounts for the other half.

The skill composition of this net immigration and the implications for the stock of human capital in the Canadian economy depends on a variety of factors. These factors include immigration policy, the relative health of the Canadian economy compared to sender or receiver countries, taxation regimes, specific industry opportunities, quality of life, and a host of other factors. Other papers produced for the Panel deal with brain drain issues and the associated flows of human capital, so this will not be further discussed here. Instead, we focus on age trends in the overall population.

The Youngest Cohort

As shown in Chart 1, the early childhood and elementary education client group, those aged 0 to 14, is expected to decline as a proportion of the population over the next decade, falling from 19.2 percent of the population in 2000 to 16.9 percent in 2010.

Chart 1



Source: Analysis of Inforemetrics Ltd., 1997 projections.

The absolute size of the group shrinks to 5.8 million in 2010, down from roughly 6 million in 1995. Assuming constant per student expenditures, a shrinking student base in elementary schools may free some resources for greater attention to early childhood education programs.

Secondary and Post-secondary client groups

The main client group for secondary and post-secondary education, 15 to 24 year olds, shows little change in share of the population in the next ten years, declining from 13.4 percent of the population in 2000 to 13.0 percent in 2010. Because base population continues to grow at roughly 1 percent per year, however, the size of the number of young adults increases from 4.2 to 4.4 million between 2000 and 2010.

Early Career

The early career group, those aged 25-34, continues to shrink, from 16.6 percent of the population in 1995 to roughly 13.5 percent in 2005 and 2010. This is what is usually meant by a shrinking cohort of young labour market entrants. Most of this decline will have occurred by the year 2000, however, with a drop in numbers of nearly 10percent, from 4.9 million to 4.5 million between 1995 and 2000. The number of persons in this age category will shrink a little between 2000 and 2005, but is expected to grow again to 4.6 million by 2010.

Mid-Career

The mid-career age group, those age 35-44 who made up 17.2 percent of the population in 1995, will shrink to 13.9 percent of the population by 2010. This age group has the highest rates of labour force participation at 85 percent in 1995, 92 percent for males and 78 percent for females.

Later-Career

The later-career group, those age 45-54, will continue to grow through 2010, rising from 14.1 percent in 2000 to 15.9 percent in 2010. Overall participation rates in this age group have been rising as female participation rate in this age category rose from 48 percent to 72 percent between 1976 and 1995.

Transition-to-Retirement

Similarly, the transition to retirement group, those 55-64 years old, will grow from 9.1 to 12.7 percent of the population over the 2000 to 2010 period. The labour force participation rate of males in this age group fell from 77 percent to 59 percent between in 1976 and 1995, with much of the decline in participation occurring among those over age sixty.

Much has been said about the aging of the Canadian population, as the population bulge created by the baby boom of 1947-1966 moves through middle age and into retirement.¹ The leading edge of this boom generation is now 52, and the lagging edge, 33 years of age. Over the next ten years, boomers will begin to hit retirement ages, particularly if trends toward early retirement continue, but the largest impact of boomer retirement is not likely to be felt till after 2010.

¹ See David K. Foot, *Boom Bust and Echo*, Toronto: McFarlane Walter & Ross, 1996.

Retirement Ages

Those in the traditional retirement age group, those age 65 and older, will grow from 12 percent in 1995 to 14 percent of the population in 2010. The larger surge in the over 65 population would not begin until 2012.

The ageing of the baby boom implies that over the next decade a highly educated and experienced generation of worker will only begin to leave the labour force, resulting in a large outflow of human capital from the economy. For the last several decades, highly educated youth cohorts have replaced older workers with lots of experience but relatively low education. As the leading edge of highly educated workers begins to retire after 2010, however, Canada will have a smaller educated youth cohort, replacing a large educated and experienced older workers, leading to a net loss of human capital.

Implications

From the point of view of skill development and adding to the stock of human capital in the economy, this brief overview of population trends suggests:

- At the youngest end of the age spectrum, the under 15 age group will shrink, both as a proportion of the population and in absolute numbers. This may provide opportunities for expanding early childhood education efforts for improved results at a stage in life where most experts believe that intellectual capacity is developed.
- The 15-24 year old population will shrink slightly as a proportion of the overall population, but there are actually small increases in the total number over the next decade. Providing more opportunities for human capital development in this group will likely to require more resources, unless new learning technologies or other measures can build human capital at lower cost per student. If public funding cuts are not compensated by increased private expenditures on education or increased efficiency, the implication is a slower growth in human capital formation from the youth cohort.
- If we think of human capital as a large pool of productive stuff available to the economy, that pool may well be shrinking after the year 2010 because of retirements of relatively highly educated, highly experienced boomers. One way to counter that trend would be to ensure that the cohort currently in the K-12 system (and whatever early childhood education programs exist) is better prepared for the knowledge economy than any other preceding generation.

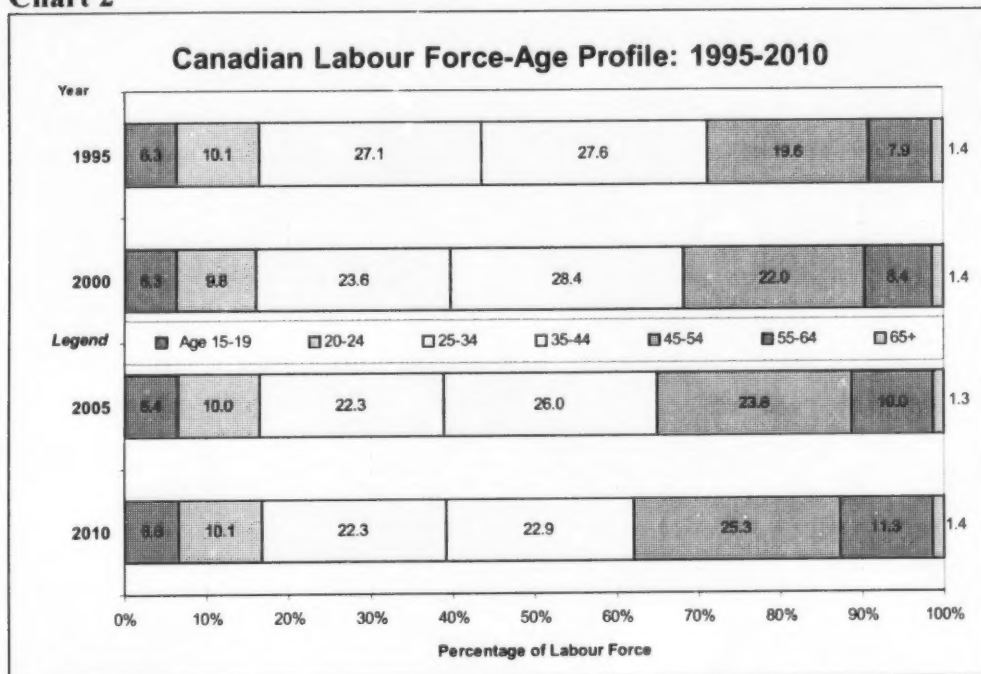
Trends in the Labour Force

Once people have entered the labour force, formal education plays a smaller role in the acquisition of skills, and human capital formation depends more heavily on employer training and experience, as well as own-account training. Betcherman, et al, argue that the changing nature of employment relationships will place greater responsibility for training on individuals, since employers may not recoup training costs. Within the labour force generally, training tends to be focussed on younger workers and those with already high levels of formal education, with some economic rationale.²

² See Betcherman, Gordon, Kathryn McMullen and Katie Davidman, *Training for the New Economy: A Synthesis*

Chart 2 shows the projected age profile of the Canadian labour force -- those who participate in the labour force either through employment or in actively looking for employment (the unemployed) -- to the year 2010. Labour force projections are derived by applying expected labour force participation rates to the population, taking into account school enrollment, family formation, retirement patterns, and other factors.

Chart 2



Source: Analysis of Informetrica Ltd., 1997 projections.

School and the Transition to the Labour Market

Labour force participation among the under 25 age group is expected to change little between 2000 and 2010. Skills acquisition of this group is dominated by formal education programs, with the growing trend toward coop placements playing an important role in matching students with employers, and facilitating school to work transitions.

Early Career

Much of the reduction in the early career cohort of 25-34 year olds has already occurred by the year 2000, and the economy will be forced to adjust to a permanently smaller group of young workers. Persons in this group can still adjust career paths to take advantage of rapidly developing opportunities in other fields, but few people make radical career changes after the mid thirties. Beginning mainly in the 30s, changing careers or returning to school becomes more difficult because of family constraints, and the opportunity cost of returning to school due to foregone wages. As this age group shrinks, therefore, the economy loses some flexibility because relatively fewer people in the labour force are available for career changes.

Mid-Career

By the year 2000, the impact of the baby boom is evident in the 35-45 year age group. This age group is characterized by established careers and human capital growth derived from work experience. Acquisition of additional skills would be primarily employer provided, as family obligations make it more difficult to take traditional campus-based courses outside of working hours.

New learning technologies including distance education may play an important role in overcoming the most commonly cited barriers of lack of time and money. By 2010 however, the relative size of this group has shrunk to 23 percent of the labour force from 28 percent in 2010.

Later-Career

Less than a decade ago, workers over the age of 45 were often called "older workers." As the 45 to 54 year old group grows, however, more and more people may be offended by this term and perhaps that's why it seems to be used less frequently. Over the next ten years, however, the 45-64 year old group will increase from about 30 percent of the labour force to 37 percent in 2010. While this group has high levels of human capital gained from education and years of training and experience, additions to this human capital are typically gained mainly from experience and relatively rarely from formal training. Investments in training, both by employers and individuals, are affected by a shortened period over which training costs may be recouped in higher productivity and wages.

Implications

- As the labour force ages, the economy benefits from increased human capital derived from experience, but may lose flexibility due to increased costs of career change, and shortened payback periods.
- New learning technologies could play an important role in overcoming some barriers to training among mid career workers with time constraints due to family obligations.
- Computer based learning technologies may also play an important role in augmenting the skills of older workers, who are often reluctant to sit in traditional classrooms with instructors. Self-paced and private learning may play an important role in lowering cost and other barriers to training, and generally allow greater capacity to adjust to changing technology among older workers.

Aboriginal Peoples

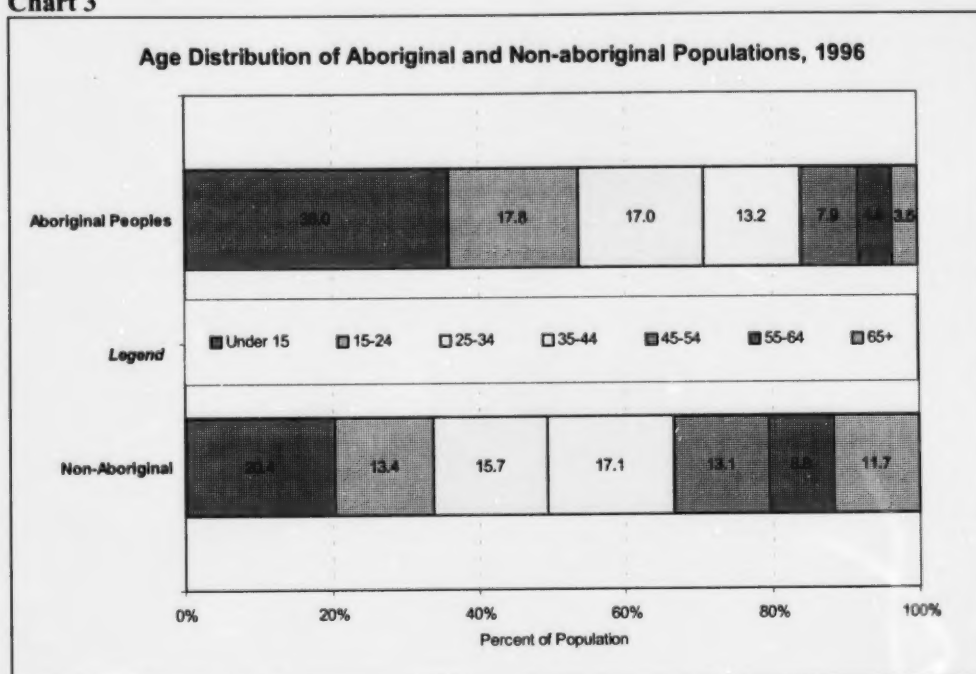
One of the main messages from demographics is that the economy will have to adjust to relatively small incoming cohorts of young workers. The implication is that the economy will have to become better at educating and directing young people into areas of the economy where they are most needed. Built into this effort, therefore, is better use of resources, which in the past have been largely ignored or wasted. Fairly obvious examples include women, whose participation rates in science and technology occupations continues to be well below that for males, and the Aboriginal population of Canada, whose participation in the mainstream labour markets and the knowledge economy remains well below the average.

A more coherent focus on the development of human capital among aboriginal peoples is important for a variety of reasons, including economic ones. As noted in *People to People, Nation to Nation*, a report from the Royal Commission on Aboriginal Peoples published in 1996, "Higher birth rates and life expectancy have produced a sharp increase in the Aboriginal population. The number of children under 16 is especially high, with sobering implications for future job needs."³

Chart 3 compares the age profile of Aboriginal peoples in Canada with that of the rest of the population. In 1996, 54 percent of the Aboriginal population was under the age of 25, and 1 in 3 Aboriginals were under the age of 15. This profile is in marked contrast to the rest of the population, where only 1 in 5 were under the age of 15 in 1996, and 34 percent were under 25 years of age.

The relative youth of the Aboriginal population presents an enormous opportunity to turn around a sad legacy in Canadian history. With appropriate programs and investment, Aboriginal youth can take advantage of opportunities and participate much more fully in the benefits of a modern knowledge-based economy than their preceding cohorts.

³ Page 40.

Chart 3

Source: 1996 Census of Canada.

But the importance of skills development of Aboriginal youth is not limited to the economic development of the First Nations, in the Northern regions of many provinces, Aboriginals form a significant proportion of the youth cohort entering the labour market. This can be seen in Chart 4, which shows the proportion of Aboriginal youth, within the overall population, on a national and provincial basis.

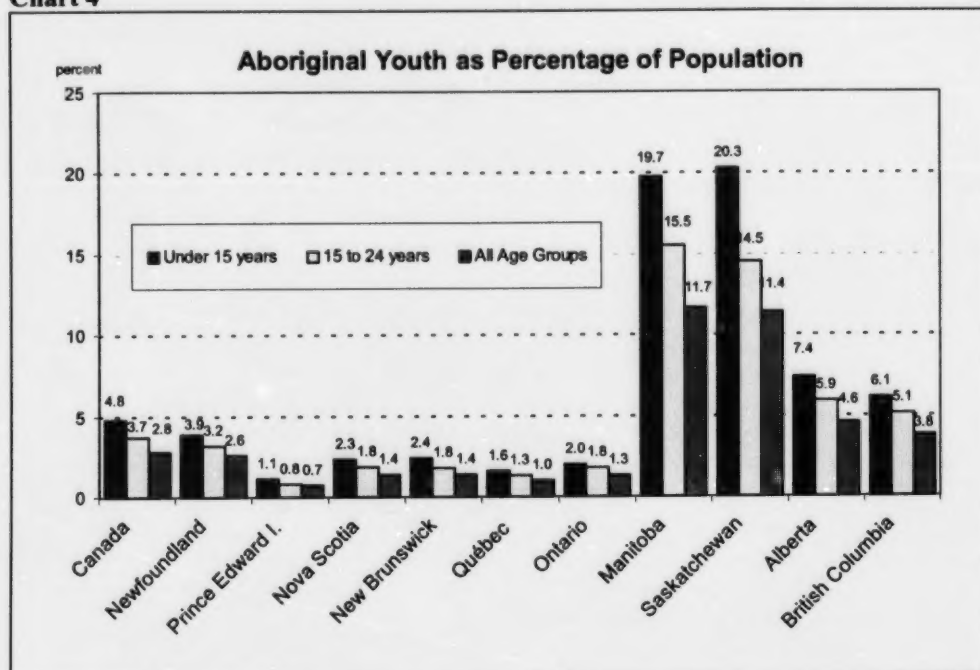
Perhaps the most striking feature of the chart is the relative importance of the youth cohort in the Western provinces. In Manitoba and Saskatchewan, a large and growing proportion of the youth cohort will be of aboriginal origins, due to the fact that aboriginals form roughly 20 percent of the under 15 population.

In Canada as a whole, aboriginals formed 4.8 percent of the under 15 cohort in 1996, fully 2 percentage points above their representation rates in the entire population.

Implications

Aboriginal persons have rarely been considered to be a critical resources in meeting the skill needs of the future. The aboriginal baby boom, combined with greater recognition of the importance of education in the aboriginal, suggests that programs to promote skills development among Aboriginal groups should play an important role in meeting skill needs in certain segments of the Canadian economy.

Chart 4

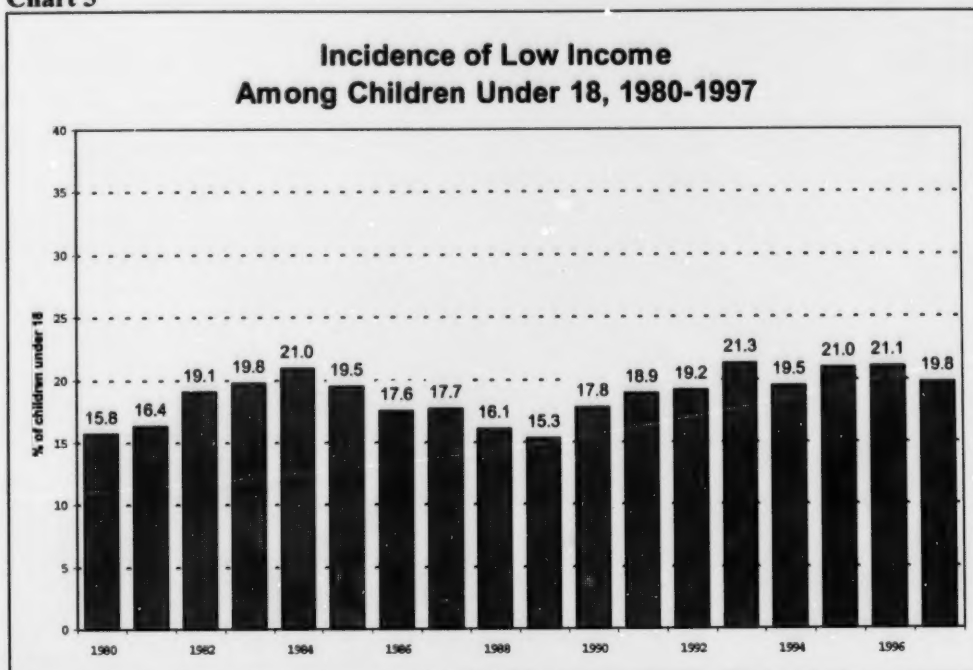


Source: 1996 Census of Canada.

Youth Population and Incidence of Low Income

With a permanently smaller youth cohort entering the labour force, building the human capital pool for the economy should also involve raising the skill levels and employability of those most likely to “fall through the cracks.” In Canada, this risk is very likely associated with relatively low levels of family income. Though no consistent measures of poverty rates over time exist in Canada, Statistics Canada’s low income cut-off is the most widely used proxy for poverty rates in Canada.

LICOs “identify those who are substantially worse off than average,” and as such are a measure of relative not absolute poverty. While LICO measures are controversial because they don’t necessarily indicate abject poverty, they are more correctly interpreted as that segment of the population that is less likely to have access to the hallmarks modern culture such as cars, computers, and access to higher education.

Chart 5

Source: Statistics Canada, *Low Income Persons, 1980-1997*, April 1999, cat.13-569.

More importantly, from the point of view of skill development, children growing up in relatively poor families may have much less access to early childhood education or environments that stimulate intellectual capacity. Most scientific evidence suggests that intellectual capacity is formed within the first three years of life, and that nutrition, environment and intellectual stimulation, or lack thereof, forms a permanent foundation for later development of specific skills.⁴ Ensuring that Canadian youth have access to high quality early childhood programs or environments will mean a much greater capacity for human capital development as they grow through the education system and into the workforce.

Chart 5 shows the proportion of Canadian children under the age of 18 living in households where income falls below the low income cut-off. During the 1990s, roughly one in five children were in low income households. While incidence of low income is clearly related to the business cycle, a disturbing recent pattern is that rates have remained relatively high well into the economic recovery.

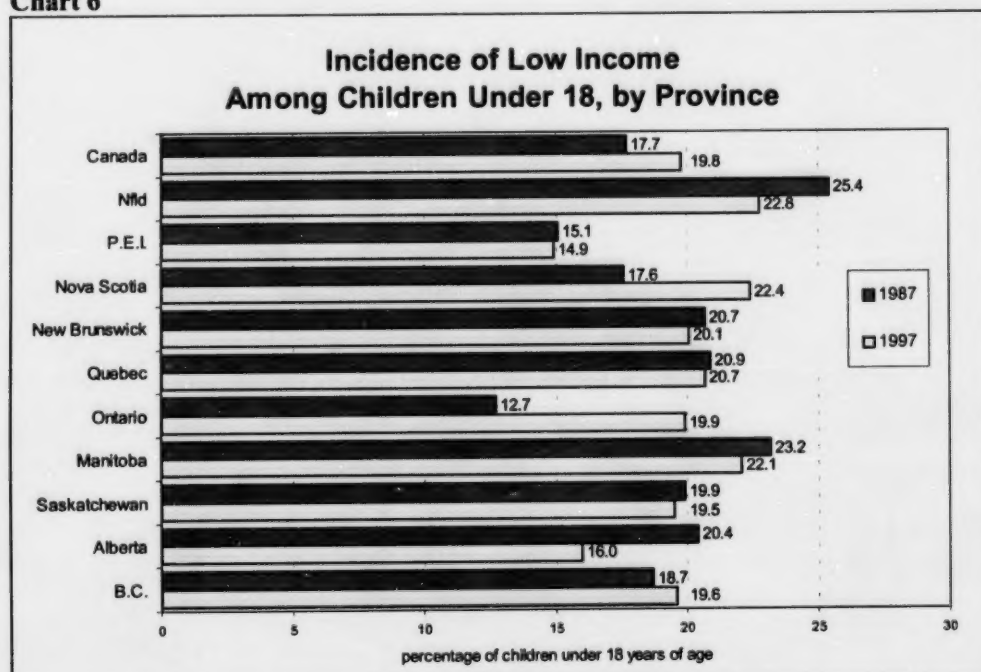
⁴ See *Early Years Study: Reversing the Real Brain Drain*, Margaret McCain and J. Fraser Mustard, co-chairs, April 1999. Report prepared for Hon. Michael D. Harris, Premier of Ontario.

Chart 6 shows that much of the higher incidence of low income between 1987 and 1997 is associated with increased rates in Ontario, with Nova Scotia echoing this pattern. The incidence of low income among children declined notably in Alberta and Newfoundland, but was relatively stable in other provinces between these two years positioned at roughly similar points in the national business cycle.

Implications

The essential point here is that skill development begins very early in life, and families with low incomes are less likely to have the means to provide their children with a solid foundation for future human capital acquisition. For economic and social reasons, expanding our investments in early childhood education is very likely to be one of the soundest investments to promote a more productive as well as equitable economy in the future.

Chart 6



Source: Statistics Canada, *Low Income Persons, 1980-1997*, April 1999, cat.13-569.